



Opportunity together with ZAPARAY and UGENT for a

PhD PROJECT



Biocidal impact of the technology change from UVC discharge lamps to UVC LED as a sustainable solution for virucidal and bactericidal water disinfection.

GENERAL CONTEXT

ZAPARAY is a start-up with focus on UVC-LED innovation and product development to bring **sustainable disinfection solutions based on UVC LED technology** to the market.

UVC radiation originating from mercury lamps is already for over 100 years an important source of disinfection, however its severe environmental impact due to toxic mercury compounds and high energy consumption is an obvious driver towards alternative light sources.

With the recent **evolution of LED technology**, it becomes more and more feasible to **replace the mercury lamps by LEDs** as UVC radiation source.

Mercury lamps as used in most academic literature have a single wavelength in the ultra-violet spectrum, being 254nm. LEDs come at multiple wavelengths, hence the **limited knowledge on the effects of these different wavelengths on the bactericidal and virucidal biocidal efficiency**.

ABSTRACT

The goal of this project is to investigate the efficiency and efficacy of UVC-LED radiation for both virucidal and bactericidal reduction.

During this PhD fellowship you will investigate the correlation between different UVC (LED)-light wavelengths and the disinfection log reduction on a wide variety of viruses and bacteria. The virucidal and bactericidal characteristics can then be correlated to the respective UVC-wavelengths.

Therefore, you will make use of different techniques to quantify the UVC dose under water and to investigate its relationship with environmental aquatic parameters. Moreover, you will employ various techniques to culture different viruses and bacteria and how to quantify their infectivity (before and after application of UVC LED light).

In an initial phase, this research will focus on virological and bacterial reduction in air and afterwards also disinfection in aquatic environments. Eventually, the most optimal disinfection approach by means of UVC-LED technology will be deciphered to achieve the best biological water quality from contaminated water sources.

Our objective is to quantify the most energy-efficient water sanitation method to provide a sustainable and energy-friendly solution for both industrial water applications, as in rural areas of developing nations.

This project is endorsed by the UVC-LED technology of ZAPARAY and runs in close cooperation with the **Laboratory of Liver Infectious Diseases (LLID)** headed by Prof. Dr. Philip Meuleman and **Laboratory Bacteriology Research** headed by Prof. Dr. Piet Cools, both at Ghent University.

It is the intention to write this project proposal together with ZAPARAY, submit it for a Baekeland mandate and defend it for the jury. After positive evaluation, you will embark on this 4-year PhD research project.

For more information on Baekeland-mandate and related procedure: <https://www.vlaio.be/nl/subsidies-financiering/baekeland-mandaten/wat-is-een-baekelandmandaat>

EXPECTATIONS

- You have a Master in Bio-engineering, (Bio-)Sciences, Biomedical Sciences, or equivalent with at least *cum laude*
- You are passionate to obtain a PhD and a strong interest in sustainability, photonics, virology and bacteriology is a plus.
- Our ideal candidate has following competences:
 - You show initiative, are creative, enthusiastic, eager to learn new things and ambitious.
 - You work result-driven and have a hands-on mentality.
 - You have an analytical and pro-active, solution-oriented mindset.
 - You have strong communication skills, feel comfortable in networking with other research teams and skilled in (English) academic writing and presenting.
 - You are good in organizing, planning and coordinating the different research aspects and able to respect deadlines.

OFFER

We offer an initial temporary contract (until December 2021) which is, depending on the favorable evaluation of the Baekeland mandate, extendable to 4 years with a competitive salary.

INTERESTED?

Send your motivation and CV by email to Philip.Meuleman@UGent.be by August 1, 2021.

Selected candidates will be invited for an interview with the different project stakeholders.

Further questions?

- Project-related: contact Duncan Verstraeten (duncan@zaparay.com), Mieke Flour (mieke@zaparay.com) or Philip Meuleman (Philip.Meuleman@UGent.be)
- About HR and remuneration aspects: Philip.Meuleman@UGent.be