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| Title of the thesis | POrous MAterials for the capture and the DEcomposition of CoronaViruses |
| Acronym | POMADE-CoV |
| Reference number | 020 |

| Hosting institution | Employer |
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| Thesis information | |
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| Keywords | coronaviruses, capture, inactivation, macroporous materials |
| Abstract | <p>The current Coronavirus disease 2019 (COVID-2019) highlights our weakness against new dangerous viral agents like SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2). Indeed, the development of a novel anti-viral treatment requires several months, and this time is incompatible with the possible rapid spread of emerging disease.</p> <p>In this project, we propose to develop tailored porous materials able to quickly capture and inactivate coronaviruses. Macroporous silica will be synthesized and functionalized in order to guarantee both the immobilization and the destruction of the virus. Indeed, the porosity of macroporous silica is sufficient for the capture of large species such as coronaviruses (>80 nm), while their chemical surface functionalities allow the anchoring of chemical agents able to deactivate micro-organisms. For this last task, the efficiency of different guest virucides (proteins, metallic nanoparticles, photocatalytic oxides, etc.) will be incorporated within the macroporous matrix. The composite materials, exhibiting macroporosity and antiviral activity, will be tested on coronaviruses, including SARS-CoV2 (COVID-19).</p> <p>This PhD student will be supervised by Prof. Christophe VOLKRINGER (Ecole Centrale de Lille) and Prof. Anne GOFFARD (Pasteur Institute of Lille), worldwide recognized experts in porous materials and virology, respectively. This project will involve a close collaboration with the team of professor Seth M. COHEN (University of California San Diego) and the French multinational corporation <i>Saint-Gobain S.A.</i> The PhD student will be on secondments in the laboratories of each collaborators for a training of 3 months. During the PhD process, the student will also participate to international congress related to the project.</p> |

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| <p>Expected profile of the candidate</p> | <p>The candidate must have a background in biology and/or materials chemistry. In addition to her/his experience, the candidate would benefit from interdisciplinary training in virology or materials chemistry, from the host scientific teams.</p> <p>During the PhD project and via collaborations, the student will spend time in the team of Prof. Seth COHEN (University of California San Diego, USA) and in the research laboratory of the multinational corporation Saint-Gobain SA (France)</p> |
| <p>Application procedure & Eligibility criteria</p> | <p>The application procedure and eligibility criteria are detailed on the European doctoral programme PEARL website www.pearl-phd-lille.eu. The funding is managed by the I-SITE ULNE foundation which is a partnership foundation between the University of Lille, Engineering schools, research organisms, the Institut Pasteur de Lille and the University hospital.</p> <p>The application file will have to be submitted before March 31, 2021 (10:00 AM - Paris Time) and emailed to the following address : international@isite-ulne.fr.</p> |
| <p>Net salary and Lump Sum</p> | <p>A net salary of about €1,600 + €530 per month to cover mobility, travel and family costs.</p> |