

Request for Industrial Partners (23/12/2021)

Project title: ODOR REmoval to improve indoor air quality by sustainable soluTIONS

Acronym: ODORRETIION

Project ID	
Type	ICON
Period	2-3 years
Starting date	2022
Total project budget	TBD
Subsidy percentage	According to SBO and O&O regulations
Current industrial partners	Confidential
Catalisti contact	Aron Deneyer (adeneyer@catalisti.be)

Project description

Introduction

The World Health Organisation (WHO) lists indoor air quality as one of the most dangerous health threats. It can be five times more polluted than the outdoor air and bad indoor air quality was responsible for over 2.6 million premature deaths in 2016. We spend 90% of our time indoors. 50-80% of global consumers worry about air quality at home. Bad indoor air can contain toxic and malodorous compounds. These odors can originate from living organisms (e.g. sweat from humans, skin degradation, pets, and the presence of micro-organisms) and the release of chemicals related to the production process or usage of in-house materials (e.g. volatile organic compounds released after unpackaging).

Different technologies are already available to neutralize. Unfortunately, drawbacks are associated with these solutions:

- Adsorption-based techniques (e.g. zeolites, cyclodextrin, silica-based materials) are very selective and have restricted durability (rapidly saturated and frequent washing steps are required);
- UV-based solutions (e.g. based on TiO₂) are not an option indoors since they will not be exposed to sunlight;
- Chemocatalysts do not always give desirable results to eliminate odors;
- Biocides active against unwanted micro-organisms that cause malodor, are not sustainable and environmentally friendly.

Finally, a classical cleaning step is not always possible and/or desirable.

The **development of a sustainable and effective technology to prevent and eliminate unwanted odors, and thus improve the air quality in general**, is a key technology need across industrial sectors. The **application of bacteria with positive characteristics** to neutralize bad odors is envisioned as a valuable and sustainable bio-based alternative for the classical technologies. Odor removal based on biological solutions exists, but the industrial potential of good bacteria and microbial technologies is currently underused. A main innovation is to process the right bacterial strains for malodor prevention and elimination depending on the application domain. A main challenge is a possibly low activity to convert a complex mixture of odor compounds in a fast and selective manner. This project will tackle these major hurdles by the selection of the most beneficial micro-organisms as well as explore alternative and complementary technologies based on (bio)chemical solutions.

RfP ODORRETIION

Goals

In the first part, a **custom-made sampling and characterization protocol** to identify which (group of) compounds, typically leading to indoor bad odors, should be developed. Odors can be caused by environmental & human sources and can originate from materials. According to the identified (family) of odors, a **sustainable remediation solution** is required. The main objective is to develop a technology platform that can neutralize these compounds, thus minimizing the impact on indoor air quality. At the heart of the technology, we envision a sustainable solution based on **bacteria with positive characteristics or derivatives of them**. To increase the overall efficiency, complementary technologies such as entrapping and/or chemical agents will be investigated. The developed technology will be tested and **applied in three different scenarios**:

- textile application;
- home applications and areas where most bad air quality resides;
- home applications with a focus on bio-based renewable approaches.

To obtain a good insight in the technical feasibility, a **full validation process** (real life tests) is targeted in this project.

A positive environmental impact will be achieved by avoiding the usage of classical (chemical) techniques, and switching to a hybrid solution using bacteria-based technology. Moreover, this project frames in the **raising demand of customers for smart solutions for safeguarding a good air quality and the increasing possibilities of engineering sustainable microbial technologies in the developing bio-based economy**. By elaborating this project, a new technology platform based on biological solutions will be developed in Flanders.

Request

The current industrial consortium consists of:

- a global producer in the development and manufacturing of mattress textiles and covers;
- a world leader that is specialized in the production of health, care and hygiene-related products.

To complete the consortium, Catalisti is searching for complementary partners, namely:

- Partner with expertise in **microbiology and biotechnology for industrial applications, for example to eliminate volatiles and odor compounds**. This partner should be able to cultivate micro-organisms, screen and test for relevant biological activities. Moreover, this partner should perform the first processing steps;
- Partner with expertise in **processing micro-organisms** in order to control their activity, releasability, etc. These micro-organisms should be processed in a way to make them applicable. Possible processing steps (not limiting) can be for example encapsulation;
- Partner with expertise in the development of **sustainable entrapping agents** to eliminate odor compounds;
- Partner with expertise in the development of **sustainable chemical agents** to eliminate odor compounds.

How to reply to this request

Please send an **email before 25/01/2022** to Aron Deneuer (adeneuer@catalisti.be) and Linsey Garcia-Gonzalez (lgarciagonzalez@catalisti.be), and **briefly describe your interest and potential contribution** to the project. Based on all offers, the current industrial partners will determine together with Catalisti which partners can join the consortium. After submission of your offer, you can be contacted by phone to further elaborate your offer. The partner decision will be communicated on February 8th 2022 at the latest.

Important notice: Partners that wish to participate in this project are required to be member of the Flemish spearhead cluster whose domain of activity covers the partner's contribution to the project. For more information, please contact Aron Deneuer (adeneuer@catalisti.be) or Linsey Garcia-Gonzalez (lgarciagonzalez@catalisti.be).

Contact

Please contact Aron Deneyer (adeneyer@catalisti.be, +32 472 375 260) or Linsey Garcia-Gonzalez (lgarciagonzalez@catalisti.be, +32 479 450 426) if you have questions concerning this RfP.

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