



Confined **Nanoreactors** for Environmental,
Medical & Catalytic Applications

This project has received funding from the European Union's Horizon Europe research and innovation program under the grant agreement No. 101235833. Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.



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<https://nanoemca.upb.ro>

NANOEMCA Project
Call: HORIZON-MSCA-SE-2024
GA No. 101235833

Our impact

NANOEMCA develops advanced **mesoporous organosilica nanoreactors** and pushes them from lab concept to real-world use. We aim to reduce pollution and **improve water quality** by removing heavy metals, dyes and pharmaceutical residues, as well as **improve food safety** by protecting against spoilage and pathogens.

Likewise, we deliver **medical** and **environmental** air-quality and industrial **sensors**, and will strengthen the research and **innovation ecosystem** by training researchers and enabling university–industry transfer via open data.

Our objectives

1. Develop sustainable, **free** and **metal-loaded nanoreactors** for high-impact uses in **water remediation**, active **food packaging** and **medical** sensing.
2. Validate green, scalable synthesis and advanced characterization and deliver **demonstrator prototypes** (adsorbents, photocatalysts, sensors, packaging).
3. Train people and **build partnerships** through staff exchanges, open science and outreach to **accelerate uptake** and commercialization.



Key innovations

NANOEMCA introduces a **new generation** of mesoporous organosilica **nanoreactors** designed to deliver cleaner, safer and more efficient **solutions** across **environmental, food and medical** sectors. Its approach combines advanced materials engineering with four greener synthesis strategies. These routes allow **precise control** over structure, functionality and metal loading, enabling nanoreactors that **enhance** catalytic processes, stabilize biomolecules and **unlock new performance levels** in real-world applications.

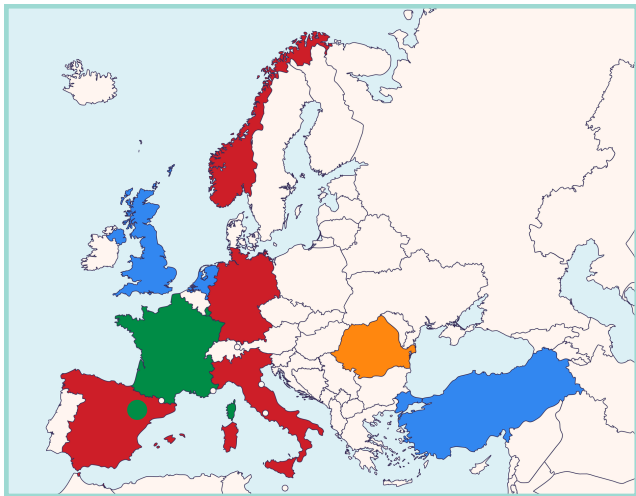
The consortium

NANOEMCA brings together a **highly complementary** mix of universities, research institutes and SMEs from Europe and partner countries. Together, they **combine expertise** in **nanomaterial synthesis**, advanced catalysis, food chemistry, biomedical applications, sensor development, environmental testing and sustainability assessment.

The partnership is designed to work as an **integrated network** in which organisations exchange skills, infrastructure and experience through secondments and joint trainings, so that the project can **move efficiently** from fundamental material **design** to **practical applications** and wider exploitation.



The consortium

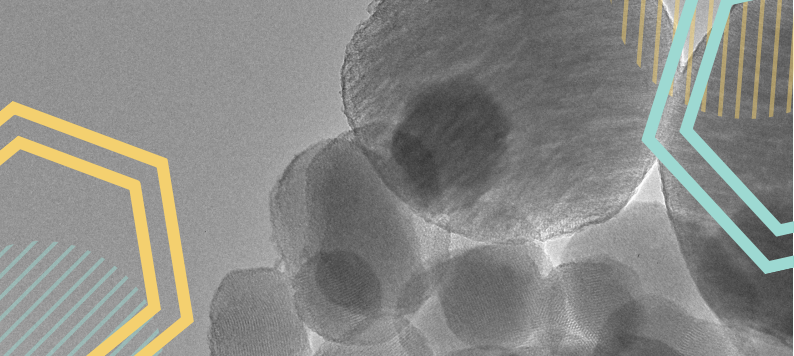


- 🇮🇹 National University of Science & Technology POLITEHNICA Bucharest (**Coordinator**)
- 🇩🇪 University of Berlin
- 🇳🇴 Norwegian University of Science & Technology
- 🇮🇹 University of Udine
- 🇪🇸 University of Zaragoza
- 🇪🇸 University of Pamplona
- 🇫🇷 Centre National de la Recherche Scientifique
- 🇱🇺 Luxembourg Institute of Science & Technology
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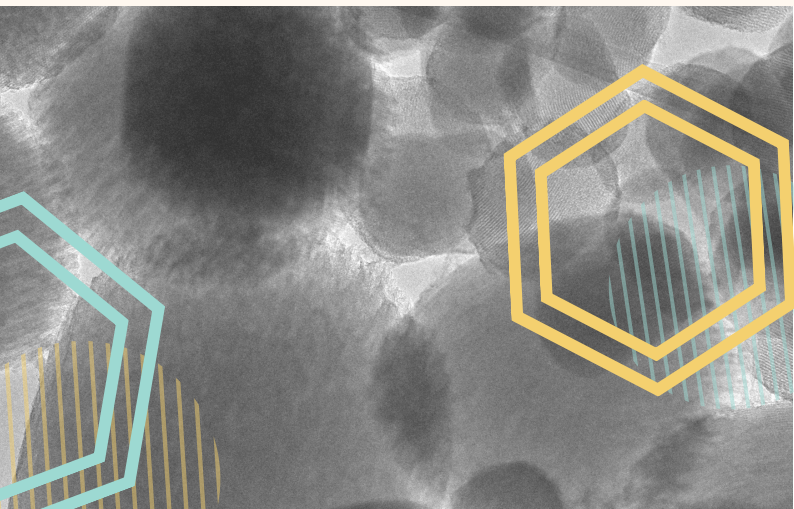
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& HEIs**

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Technology
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