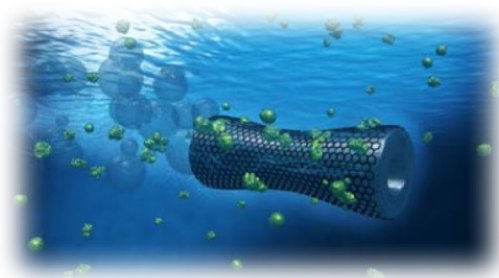


CLEANBOTS: Self-propelled nanobots for water remediation

The Challenge

Water pollution ranks as one of the top environmental threats to ecosystems and human health. Problems related to contaminated water are currently affecting millions of people worldwide as the number of pollutants (heavy metals, industrial solvents, detergents, pharmaceuticals pesticides and so on) keep rising with increased human industrial and agricultural activities. Moreover, energy costs are a major concern for water/wastewater utilities and municipal officials, accounting for as much as 55% of facility operating budgets and 30 to 40% of their energy consumption. As stated by the European Innovation Partnership of Water, there is a need to address major European and global water challenges, which cannot be addressed or solved with the current approaches and technologies.



The Market

The global water treatment chemical market is expected to reach an estimated \$32.8 billion by 2021 with a CAGR of 3.4% from 2016 to 2021. The major drivers of growth will be improving water quality standards and increasing demand of clean water. CLEANBOTS present huge potential on the treatment of industrial and agricultural activities, especially on industries such as mining, pharma and cosmetic manufacturing, paper pulp bleaching and olive oil. Furthermore, CLEANBOTS may be adapted by centralized water suppliers or onsite water purification systems that are looking for faster, more affordable and less aggressive processes.

The Asset

CLEANBOTS is a novel submersible multiscale and multifunctional self-propelled system capable of cleaning several types of aqueous environments from chemical and biological pollutants using a combination of cutting-edge technologies (electromagnetics, micro- and nanorobotics) and advanced chemical functionalization.

Product Opportunity

Current technologies for water purification exhibit several limitations like the high pressures needed for filtering processes, the unhealthful or corrosive by-products left during chemical disinfection, the need of special equipment and the low effectiveness of high-energy radiation, or the potential toxicity of nanoparticles for water remediation. CLEANBOTS can integrate several capabilities to perform more complex and demanding operations, as well as be mass-produced, recovered and re-cycled. They can also be specifically designed for different contaminants, present self-mixing capabilities and can be electromagnetically guided.

Scientific Project Leader

Dr. Samuel Sanchez
(<http://ibebarcelona.eu/nanodevices>)

Stage of Development

Technology concept formulated and validated. Proof-of-concept for water remediation is ongoing.

Development of two types of CLEANBOTS (chemical and magnetic) and a hybrid system.

Safety and corrosion assessment.

Intellectual Property Status

Patent application on-going.

Exploitation Plan

Licensing and/or co-development.

Contact

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