

Short Communication

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Microorganisms Communicating Via Coherence Domains: The Italian Frontier of Sustainable Biotechnology

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Mirko Fanelli Combines Microbial Molecular Genetics with Del Giudice's Physics, Italy

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Researcher Mirko Fanelli, through his company Fane Biotics and in collaboration with various scientific partners, is spearheading an ambitious research and development (R&D) project. This initiative merges molecular genetics with the quantum physics of biological systems, drawing inspiration from physicist Emilio Del Giudice's theories on water coherence domains.

This technology represents a major scale-up of a previous technology; in addition to Fanelli, the brilliant minds involved included Dr. Roberto Ercolani, Dr. Andrea Graziani, Dr. Francesco Alessandrini, and Dr. Angelo Badini.

The goal is to enhance “quorum sensing” the ability of microorganisms to communicate with one another in order to improve the performance of microbial strains isolated from nature.

This innovative application of physics to biological systems paves the way for more effective and “intelligent” microorganisms capable of acting synergistically and coordinating like living networks.

Microorganisms that Protect and Regenerate

Applications are diverse, spanning the environment, agriculture, purification, and bioremediation.

The microbial active agents developed by Fane Biotics demonstrate strong antagonistic properties against:

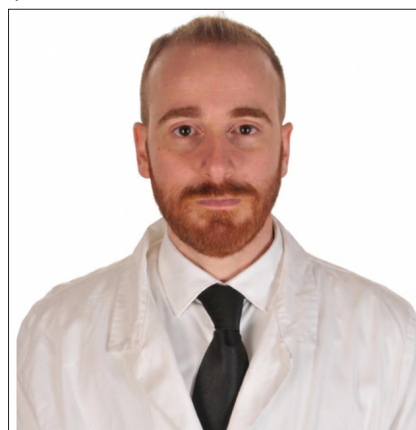
- pathogens and Class 2 bacteria,
- parasites and nematodes,
- pollutants such as microplastics and heavy metals, facilitating their natural degradation. After more than a decade of research, Fanelli and his team have optimized the concentration of CFUs (Colony-Forming Units), achieving record levels of 10^{11} microorganisms per gram (100 billion per gram).

Now, thanks to a new phase of study focusing on coherence domains, the aim is to further enhance the bacteria's communicative and cooperative efficacy by leveraging principles of quantum coherence applied to biological systems.

A Recognized Italian Achievement

This vision integrating molecular biology, theoretical physics, and environmental applications marks a decisive step toward a new paradigm in sustainable biotechnology.

It is a field in which Italy, thanks to Mirko Fanelli and Fane Biotics, stands as a pioneer—a status already acknowledged by various international scientific journals and national newspapers. Recognition from the scientific community at the AgriTech Lisbon 2026 event, combined with citations of his technology in scientific literature, led to Fanelli's appointment as chair of the international scientific committee for Agrovant Tokyo 2027, scheduled for April 23–24, 2027.



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