



Microbiome Applications in the Food System and Nano Life Sciences: New Learnings at the NANO-DAY IV Conference

Press release: December 2019

The EU Horizon 2020-funded **SIMBA** project aims to gain a better understanding of microbiome structure and function, related to marine and terrestrial food chains and to verify the sustainability of microbial innovations of the food system. Recently, **SIMBA** project partners attended the fourth NANO-DAY conference which took place in Milan, Italy on 11th – 14th December 2019. The conference focused on nanotechnology and nanomaterials, with two key topic streams of ‘Nano in Life Sciences’ and ‘Nano in Physics, Chemistry and Technology’. With an estimated 350 participants from industry, research, policy and government, the conference had a strong emphasis on new nanotechnology materials, nanomaterial engineering, and nanobiotechnology.

At the event, **SIMBA** hosted a special session under the ‘Nano in Life Sciences’ topic, organised by Nelson Marmiroli and chaired by Elena Maestri, from partner University of Parma. The team’s session, titled ‘nanotechnologies and nanomaterials in agriculture and food production’, presented **SIMBA**’s progress and key findings to date. The session linked microbial applications in food systems with nanotechnology, which could lead to novel discoveries and collaboration. These could include the use of nanomaterials in agriculture to suppress crop diseases, and improved food production by increasing efficiency of inputs and more targeted nutrient delivery. Such innovations are essential with the growing challenges posed by climate change and a rapidly growing global population.

Project coordinator Anne Pihlanto (Luke) opened the session by introducing **SIMBA**’s holistic approach that exploits microbiomes in agriculture and aquaculture to increase sustainability in food production. Pihlanto also noted the numerous expected impacts from the project, including increasing productivity, quality, safety, sustainability and nutrition security in the food chain, as well as longer-term impacts such as increased innovation capacities of public and private food system stakeholders.

Four specific strands of **SIMBA** research were highlighted and discussed, including research which seeks to identify candidates of Plant Growth-Promoting Microbes (PGPMs), which are potential alternatives to chemical fertilisers and pesticides, presented by Silvia Tabacchioni (ENEA). Innovative research on microbial processing for nutritional enhancement of plant-based products was then introduced by Minna Kahala (Luke). The findings could ultimately lead to protein-rich food products with improved nutritional value, digestibility, and safety. Anna-Maria Pajari (University of Helsinki) presented ongoing human intervention trials analysing how a sustainable diet, or a side stream-derived food produced utilising microbes, shapes the human gut microbiota and health. The final presentation from Milena Stefanova (ENEA) covered the sustainability assessment and potential uptake of microbial innovations developed from the project. Stefanova described the comparative environmental life cycle assessment (LCA) and social-LCA required to assess the overall increase in sustainability of microbial innovations. Additional presentations from conference participants

highlighted the possible role of nanotechnologies in sustainable agriculture, and a lively discussion evidenced the difference in approaches between EU and USA.

After the event, SIMBA Coordinator Anne Pihlanto noted “there are key strong benefits of sharing **SIMBA** activities with researchers interested in nanotechnology and plant production. It was beneficial for us to meet other actors and the event has highlighted the need for harmonisation of legislation and regulation”

For more information please visit the project website at simbaproject.eu or follow us on Twitter [@SIMBAproject_EU](https://twitter.com/SIMBAproject_EU)

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Caption: Some of the SIMBA partners presenting during the SIMBA session at NANO-DAY

Notes for the Editor:

SIMBA - *Sustainable Innovation of Microbiome Applications in Food System* is funded by the European Union Horizon 2020 funding programme for Innovation Action (IA), Grant Agreement Number 818431. It aims to gain a better understanding of microbiome structure and function, related to marine and terrestrial food chains and to verify the sustainability of microbial innovations of the food system. Focusing primarily on agriculture and aquaculture, SIMBA harnesses complex soil and marine microbial communities for sustainable food production, delivering tangible benefits to society. The SIMBA project runs from 2018 – 2022 with an overall budget of €10 million.

The SIMBA consortium consists of strong multi-stakeholder, multi-disciplinary partners from across Europe and forms a well-balanced mix between fundamental scientists, applied scientists and enterprises that have a track record in bridging fundamental science to applications in the food industry.

SIMBA is coordinated by LUKE – Natural Resources Institute Finland. AquaTT is the project communication, dissemination and exploitation partner.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 818431 (SIMBA). This output reflects only the author's view and the European Union cannot be held responsible for any use that may be made of the information contained therein