

Fermented insect pheromones for environmentally friendly pest control

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Sex pheromones, which are produced naturally by insects for mating communication, present an environmentally safe alternative to insecticides for pest control. Whereas insecticides have severe negative effects on public health and the environment, pheromones are biodegradable species-specific compounds that neither affect beneficial species in the ecosystem, nor exert adverse effects on human health. Pheromones are currently produced by chemical synthesis, which requires expensive and often hazardous specialty chemicals as starting materials and usually results in toxic waste as by-products.

We developed a biotechnology-based solution to enable cheaper and environmentally friendly production of pheromone

components from renewable feedstocks using yeast cell factories. This required reconstruction of synthetic biochemical pathways towards pheromones in yeast, extensive engineering of the yeast host to improve the flux towards the products, and optimization of fermentation processes. This technology paves the way for safer pest control in agriculture.

Speaker Biography

Irina Borodina is senior scientist and group leader at the Novo Nordisk Foundation Center for Biosustainability, Technical University of Denmark (DTU). She is also co-founder and CEO of BioPhero ApS. Her research focuses on advancing the methodologies for metabolic engineering of cell factories for the sustainable production of bulk and high-value chemicals. She received PhD degree in Biotechnology from DTU. She has authored 37 peer-reviewed articles, which have been cited over 1,600 times, and she is co-inventor of 9 patent applications.

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