Increasing the stability, efficacy and consistency of bioactives

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The global agri-food system is facing significant challenges in the coming decades: it needs to become more productive to feed 10 billion people by 2050, while minimizing its environmental footprint by taking a key role in limiting climate change and environmental degradation. This pressure to move towards a more productive and sustainable agri-food system has reached a point of no return and is accelerating, being driven by multiple factors, including changing consumer preferences, investor expectations, and a rapidly evolving regulatory landscape (e.g., the EU Green Deal). This productivity-sustainability imperative has created an unprecedented opportunity for companies that can develop innovative solutions to protect crop health.

At Invaio, we're developing multi-platform technology solutions that address the limitations often associated with biological-based insect and disease control agents, and creating a shift towards more sustainable, nature-positive agriculture. We bring new value to the industry, integrating breakthrough technologies to create sustainable agricultural solutions that solve big problems.

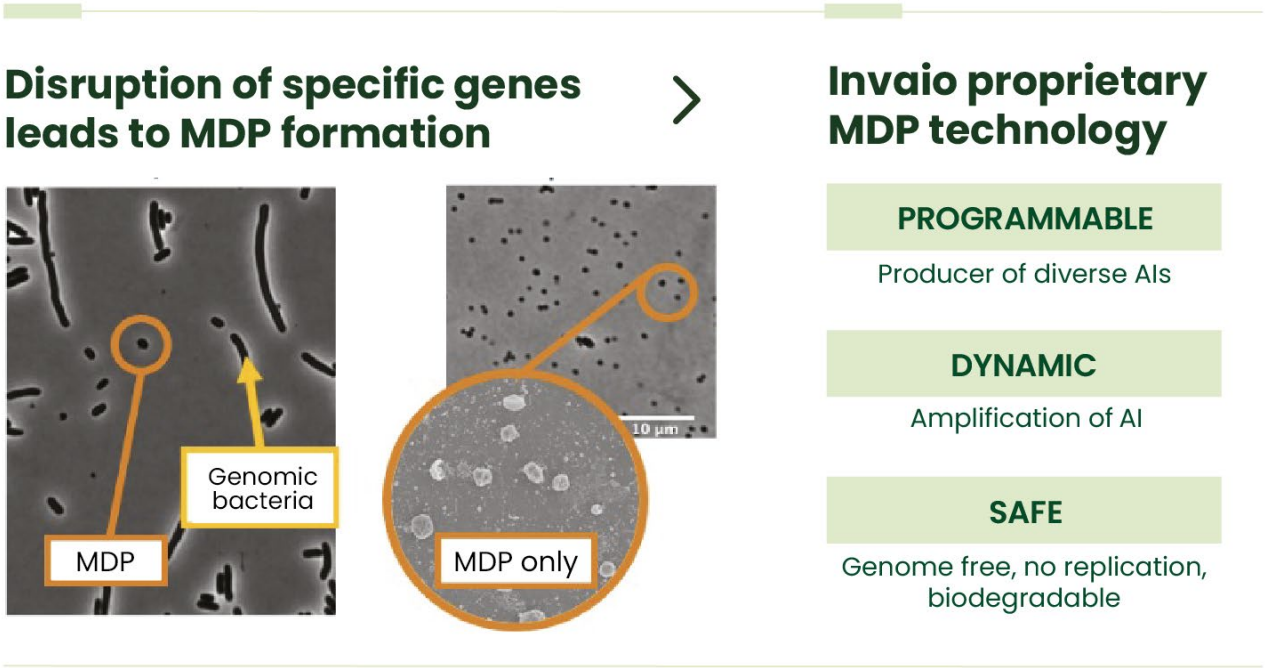
Our technology platforms include a novel infusion delivery system that precisely delivers active ingredients into the vascular system of trees and two proprietary biological delivery systems – Nature-derived Lipid nanoParticles (NLPs) and Microbe-Derived Particles (MDPs). The NLP system takes inspiration from plant exosomes and enables efficient encapsulation of active ingredients within lipid vesicles for enhanced environmental stability and delivery to target cells. Invaio's MDP technology can produce, precisely deliver, and protect a wide variety of biologically-derived active ingredients, enhancing their potential and crop protection efficacy through increased stability and reliable scalability.

MDPs are non-viable cells that can be programmed

Our MDP technology includes naturally derived, non-replicating microbial cells that can produce, protect and deliver a variety of biologically active molecules (proteins, peptides, RNAs, and natural toxins), extending their in-field stability and efficacy with viable scalability.

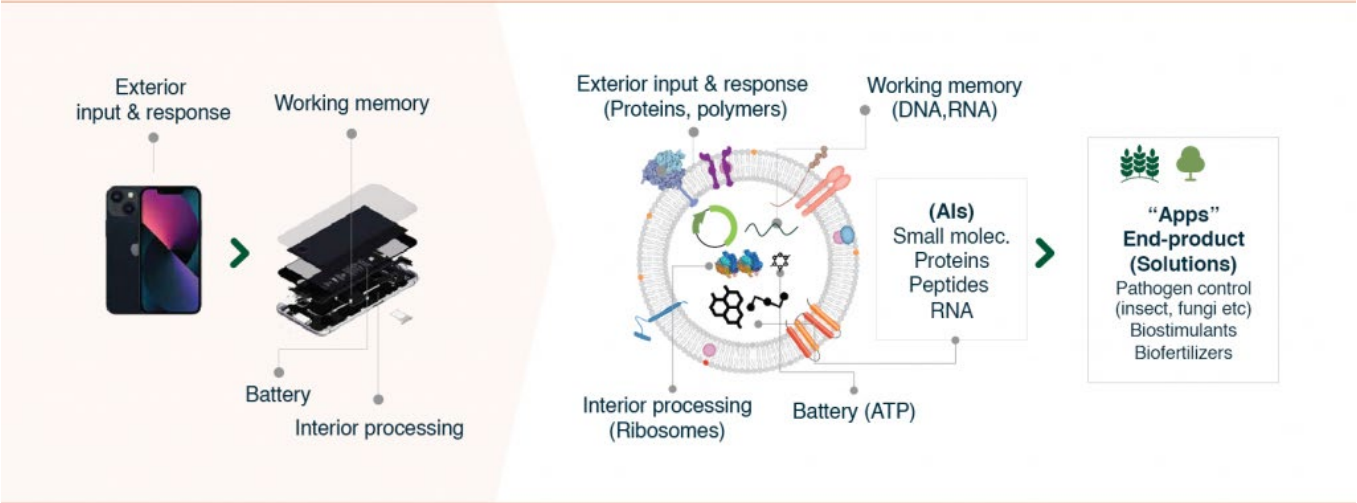
MDPs are produced from multiple microbial source organisms (e.g., *E. coli, B. Subtills*) by disruption of one or more genes involved in regulating bacterial parent cell partitioning functions. This alters the cellular division process that normally results in the production of two

symmetrical daughter cells, instead leading to the creation of a parental cell and a much smaller non-replicating MDP that still maintains the properties of the parental cell, including surface properties and intracellular contents. MDPs are biodegradable and can be readily designed, programmed, and scaled up using standard molecular genetic techniques and fermentation approaches.



Creating a unique platform to run biological programs

As an analogy to cell phones, which allow programmers to build a seemingly endless variety of specific Apps, we are using our proprietary biological delivery technologies to program innovative "Biocontrol-Apps" with interoperable components to create a diverse array of solutions for enhancing crop health. Like an App, new controls can be created by simply changing the MDP composition. For example, we can tune MDP's functionality by modifying their surface properties to alter the spectrum of pest or pathogen control. These unique properties of MDPs enable specific solutions for the agricultural sector to combat pests and pathogens or to deliver biostimulants and biofertilizers. MDPs can also be used to drive enhanced performance of novel and known bioactives, especially those with stability or cost challenges that limit their commercial potential.



Invaio is providing a real alternative to synthetic pesticides in agriculture

Invaio is currently developing and validating multiple solutions with the MDP platform, expressing known or novel bioactive ingredients with multiple modes of action, targeting all major crop segments (row crops, vegetables and perennials). Our ongoing validation of multiple MDP-based crop health solutions in the greenhouse and the field has established the platform as a robust delivery technology and allowed us to create a continuous pipeline of potential products. We are also incorporating novel bioactive ingredients discovered through our innovative machine-learning-powered "discovery engine". Through our unique integrated bioactive ingredient discovery and delivery technology approach, Invaio is on track to develop a diverse array of insect and fungal control products derived from MDPs expressing RNA- and/or peptide-based active ingredients.

Invaio's platform technologies have the potential to revolutionize crop health by replacing traditional chemical pesticides with efficacious, reliable, and cost-effective biological solutions: we envision starting with a desired plant health outcome and program a solution to get there

We are partnering with growers and industry-leading collaborators to develop and implement broad-based technologies with the aim of increasing on-farm profitability while also delivering increased sustainability by replacing traditional pesticides with effective and reliable biological solutions. Our solutions allow improved resistance management, providing growers with next-generation plant protection and health tools that enable delivery of biomolecules that would otherwise be unsuitable for practical use. Additionally, by enhancing efficacy through increased stability and precision delivery, we have been able to demonstrate that our platform technologies can improve the reliability and overall effectiveness of existing crop health solutions, thereby expanding the toolkit of options available to growers.

Category

Delivery platforms, Environment, Global, MDP / Microbe-derived particles, Research and Development, Technology