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Molagri raises $5.8 Mn to develop precision biopesticides against evolving pest resistance

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Toronto-based biotech startup will use fresh funding to advance engineered virus-like particles designed to target specific insect pests while sparing beneficial insects, offering a potential new approach to crop protection



Molagri, a biotechnology startup developing targeted biological crop protection solutions, has raised $5.8 million in combined pre-seed and seed funding to develop a new generation of biopesticides designed to address growing pesticide resistance and reduce unintended harm to beneficial insects.

The funding comprises $5.8 million in US dollars, equivalent to approximately $8.2 million Canadian dollars. Convective Capital, a venture fund focused on resilience, led the seed round, with participation from Y Combinator, Superorganism, Robinhood Ventures, Paul Graham and other angel investors. Julian Capital was Molagri's earliest backer and led its pre-seed round.

The investment comes as pesticide resistance increasingly complicates crop protection. Repeated exposure to insecticides can enable pest populations to develop resistance, reducing the effectiveness of existing products and forcing growers to seek alternative control measures. At the same time, concerns over the effects of broad-spectrum insecticides on pollinators and other beneficial insects are adding pressure to develop more selective solutions.

Molagri is building its platform around engineered, non-infectious virus-like particles (VLPs). These particles are designed to recognise receptors found in specific target insect pests and deliver genetic instructions that prompt the target pest's own cells to produce an insecticidal payload. According to the company, beneficial insects that lack the relevant receptors would not be targeted by the system.

The platform is designed to be modular, allowing the company to modify the particles' targeting mechanisms and insecticidal payloads as pest populations evolve. Rather than developing every new product from the ground up, Molagri aims to adapt its underlying technology to address different pest-control challenges.

The company plans to focus its initial product development on pests affecting tree nuts and tree fruits, segments where growers face a need for additional crop protection options. Its approach seeks to combine the specificity of biological targeting with the adaptability of protein engineering, potentially creating alternatives to conventional broad-spectrum insecticides.

"Farmers shouldn't have to worry about resistance, the same way you don't think about which flu strain is going around when you get a flu shot," said Zaky Hassan, co-founder and CEO of Molagri.

"We want to be the team that designs the next product before resistance becomes a problem in the field. This funding lets us build out our lab and hire the scientists to get there," Hassan added.

Molagri was founded by Hassan and co-founder and chief scientific officer Min Jin, whose backgrounds are in viral structural biology and protein biochemistry. Both studied human coronaviruses at the University of Toronto. Jin holds a record for the highest-resolution coronavirus spike protein structure in the Protein Data Bank, according to the company's announcement.

The founders are applying their expertise in viral structures and protein design to agricultural pest management, an area where resistance can undermine the long-term effectiveness of existing crop protection products.

"Pesticide resistance is a slow-moving disaster for global food security, and the tools farmers have today weren't built for a world where pests adapt this quickly," said Bill Clerico, managing partner at Convective Capital.

"Zaky and Min are bringing the precision of modern protein engineering to agriculture. We think this platform can give growers a durable, targeted alternative to broad-spectrum chemicals," Clerico added.

Molagri will deploy the new capital to expand its scientific team and accelerate research and development. The company has recently moved into a larger Toronto laboratory with biomanufacturing and tissue-culture facilities and has filed a provisional patent covering its targeted VLP delivery system. It is also recruiting specialists in insect biology, virology and VLP production.

The technology remains at the development stage, with its commercial potential dependent on further research, product performance, manufacturing scalability and regulatory approval. If successful, Molagri's approach could offer growers a more targeted tool in the effort to manage resistant pests while limiting the impact of insecticides on non-target species.