

Accelerate creation of novel agrochemicals using molecularly targeted agrochemical platforms (AgroDesign Studios)



City	Year of Establishment	Founder	Website
Kashiwa-city, Chiba	2018	Yuki Nishigaya, Ph.D.	https://www.agrodesign.co.jp

Partner VC	Latest round of Fundraising	Valuation
real-tech fund	Series A	JPY 1,000 million

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○ Business Plan

As the world population continues to grow, it is important to develop highly effective pesticides to increase crop production, but at the same time, highly safe pesticides are also required. Molecular-targeted pesticides are promising as pesticides that are both effective and safe. This type of pesticide targets enzymes (proteins) that exist only in the organisms to be controlled (weeds, insects, and plant pathogens), thereby making it possible to exert its effect only on the target organism.

Although the advantages of molecular-targeted pesticides have been mentioned for some time, the technological hurdles to realize them have been high. Therefore, this project will establish a platform for the development of molecular-targeted pesticides, which will be useful for our own pesticide discovery and will accelerate the creation of safe and secure pesticides by providing the technology to Japan and global agrochemical companies.

○ Research Outline

In this project, a platform will be developed to efficiently analyze the 3D structure of the enzyme (protein) that will be the pesticide target, which is the most significant technical issue in the development of molecular-targeted pesticides. Furthermore, the platform will be used to actually create pesticide insecticides.

The platform will include: 1) an environment for rapid structural analysis of membrane proteins (using X-ray crystallography and cryo-electron microscopy), 2) computational pesticide discovery (molecular dynamics simulation and AI drug discovery methods), and 3) Digital transformation (DX) for pesticide development (automation of experiments using robots and AI).

Furthermore, these will be utilized to conduct pesticide discovery for highly challenging pesticide target proteins such as membrane proteins.

Business Area/Field	Research Period	Research Grant Amount	International collaborative technology demonstration
Food & Agriculture	STS 2023~2024FY	JPY 208 million	—

As of February,2024