

# Development of drug delivery capsule that selectively delivers mRNA et al. to immune cells (United Immunity Co., Ltd.)



City	Year of Establishment	Founder	Website
Chuo-ku, Tokyo	2017	Naozumi Harada	<a href="https://unitedimmunity.co.jp/eng/">https://unitedimmunity.co.jp/eng/</a>

Partner VC	Latest round of Fundraising	Valuation
The University of Tokyo Edge Capital Partners Co., Ltd.	Series B	JPY 2,420 million

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○ Business Plan

The development of mRNA vaccines and nucleic acid drugs is fiercely competitive worldwide. Conventional drug delivery capsules for delivering nucleic acids to cells have faced some challenges including side effects, storage stability, low cell selectivity, and the potential risk of infringing upon overseas patents. In response, we have invented a novel technology to overcome these challenges, demonstrating high accumulation within immune cells, high efficacy, and strategic avoidance of pre-existing patents. In this project, we aim to establish prototypes of vaccines or pharmaceutical drugs by optimizing the efficacy, safety, and stability of our technology, and develop manufacturing methodologies for large-scale production. Our goal is to address societal challenges, such as potential pandemics following the novel coronavirus, by leveraging domestically developed technology.

○ Research Outline

In this project, we aim to accumulate points of differentiation from technologies already in practical use, such as mRNA vaccines, by optimizing capsule compositions using proprietary lipids. In the development of the proprietary lipids, joint research is being conducted with Hokkaido University. The following are the R&D items.

- (1) Optimization of formulation composition
- (2) Concept validation in cells and animals (pharmacological experiments)
- (3) Safety validation in cells and animals
- (4) Establishment of scalable manufacturing processes

Business Area/Field	Research Period	Research Grant Amount	International collaborative technology demonstration
Healthcare	STS 2023~2024FY	JPY 300 million	—

As of February, 2024