



PI : Prof. Yen-Hsuan Ni, Department of Pediatrics, National Taiwan University Hospital, College of Medicine, National Taiwan University.

Experience: Dr. Yen-Hsuan Ni is a Distinguished Professor of Pediatrics at the College of Medicine, National Taiwan University. His clinical expertise lies in pediatric gastroenterology, hepatology, and nutrition. His research and clinical interests include: (1) pediatric liver diseases—such as viral hepatitis, nonalcoholic fatty liver disease, hereditary liver disorders, and liver transplantation; (2) gut microbiota; and (3) pediatric inflammatory bowel disease. Dr. Ni has published more than 300 peer-reviewed articles in these fields and has been actively involved in numerous international academic activities. In addition to his scientific contributions, he has played a significant role in advancing medical education reform in Taiwan. In recognition of his outstanding achievements in medical education and research, he served as Dean of the College of Medicine, National Taiwan University, from 2019 to 2025, and continues to provide leadership to Taiwan's most prestigious medical college.

Market Needs: Neurodegenerative diseases, such as Alzheimer's disease, represent a rapidly growing medical burden in aging societies, and current therapies mainly focus on symptomatic relief or single molecular targets, leaving pathogenic protein accumulation insufficiently addressed; therefore, innovative technologies capable of remodeling pathological amyloid protein condensates to facilitate their clearance are increasingly recognized as a critical unmet need in the industry.

Our Technology: This technology presents an innovative protein clearance strategy centered on condensate remodeling and dissipation modulation, addressing a critical bottleneck whereby pathological amyloid protein condensates, such as A β 42, exhibit strong resistance to ubiquitination and autophagy-mediated degradation. The invention identifies a functional class of bacterial lipid A-related molecules, defined as Condensate Remodeling and Dissipation Modulators (CRDMs), capable of modulating the physical phase properties of pathological protein condensates. Through this modulation, stable and degradation-resistant condensates are converted into states that are accessible to intracellular autophagy-lysosome systems. Experimental results demonstrate that this strategy significantly reduces pathological protein accumulation and improves disease-associated phenotypes in both cellular and animal models of neurodegenerative disorders, highlighting its disease-modifying potential and strong translational value.

Strength: (1) Introduces a novel mechanism beyond conventional inhibition or immunotherapy. (2) Directly modulates the structural and dynamic properties of pathogenic protein condensates. (3) Provides a platform strategy extendable to multiple protein aggregation-related diseases. (4) Supports a favorable safety profile suitable for long-term disease-modifying use. (5) Enables downstream drug development and functional modulator integration.

Competing Products: Current market solutions primarily include antibody-based therapies, small-molecule inhibitors, or symptomatic treatments targeting protein production or single molecular pathways. Products that directly modulate the properties of protein condensates remain largely unavailable.

Intellectual Properties:

- (1) This technology does not yet have any related patents.
- (2) The research team has decades of experience in related research fields, providing a strong scientific and technical foundation.
- (3) This invention represents a collaborative effort across institutions and has strong potential for further patent family expansion and technology transfer.

Contact (do not need to fill out):

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