# Functionalization of Amyloid Beta Peptide into Ferritin Cage and Observation of the Cage Disassembly

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The intrinsically disordered, amyloid beta (Aβ) peptides are known to linked with the Alzhaimer's disease.[1] The toxic Aβ oligomers aggregate to form fibrillar structure and deposited into brain.[1] To develop oligomer specific drug, understanding their role in the disease and the formation process of Aβ fibrils, it is important to know the details of an oligomeric state. However, due to frequent aggregation, transient nature, heterogeneity etc., it is difficult to isolate and characterize a precise oligomeric state. In this work, we aimed to encapsulate a defined number of Aβ peptides into the confined environment of a ferritin cage (Figure 1). 24 Aβ peptides were genetically fused at the C-terminal of ferritin cage which is located inside the cage. In vivo assembly will incorporate the Aβ peptides into the cage. Since ferritin cage is known to show reversible disassembly in solution, the encapsulated amyloid core can be exposed by cage disassembly.[2] This presentation will describe the process of Aβ peptides encapsulation into the ferritin cage, detailed characterization, and study of the amyloid dynamics by high-speed AFM measurement.

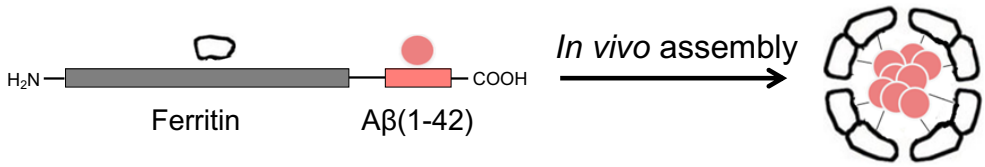


Figure 1: Schematic representation of the encapsulation of Aβ oligomer into ferritin cage.

1) S. J. C. Lee, E. Nam, H. J. Lee, M. G. Savelieffcd, M. H. Lim, *Chem. Soc. Rev.* **2017**, *46*, 310.
2) B. Maity, Z. Li, K. Niwase, C. Ganser, T. Furuta, T. Uchihashi, D. Lu, T. Ueno, *Phys. Chem. Chem. Phys.*, **2020**, *22*, 18562.