Technology from Kyoto University

Self-Assembling Protein Modules for Formation of Various Structures

We are looking to out-license the technology for its commercialization.

Flexible structures such as tube, sheet and cage can be created by combining the newly-designed protein modules through their self-assembling property

◆Background

Recently, it has become possible to design artificial protein assemblies as complex as those found in nature, but many of them are formed from a single type of protein. Also, it is still a challenge to alter a structure of the protein complex once it has been formed.

◆Description and Advantages

Kyoto University researchers have created protein modules by fusing peptides as connecting parts to various shaped proteins that serve as base parts (Fig.1). When these modules are combined, they self-assemble to form structures (Fig. 1 and 2). Since the interactions of the connecting parts are reversible, it is possible to dissociate and reassemble them (Fig.3).

- **Suitable for freely creating various structures both in 2D and 3D**
- **Elastic, extensible and flexible protein structures**
  Such protein structures may be utilized as functional biomaterials and bio-nanodevices.
- **Reversibility potentially contributes for use as cages for drug delivery**

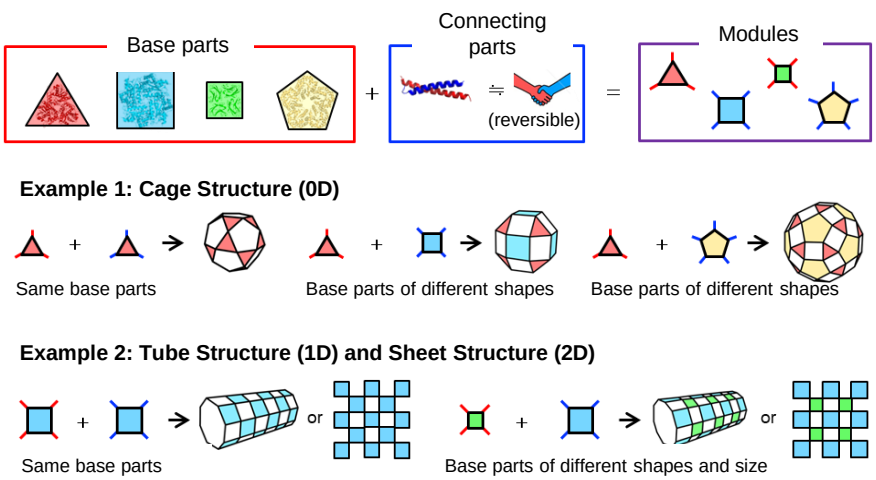

Fig.1 Protein modules and structure formation examples

By combining modules composed of base parts and connecting parts, a wide variety of structures can be formed.

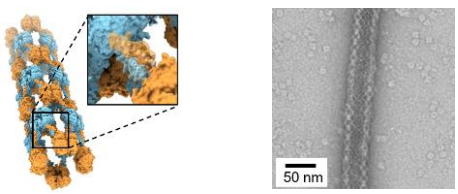

Fig.2 The simulation image (left) and the actual prototype assembly (left) of the symmetric tetrameric module

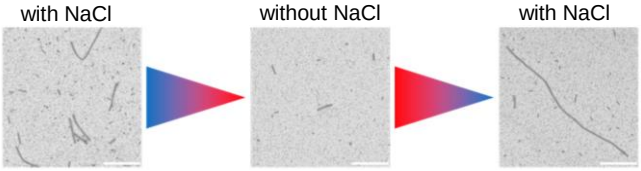

Fig.3 Reversible aggregation of the structure depending on NaCl concentration

◆Development Status

TRL: Level 1

- Various protein modules prepared and open for optimization
- Confirmed the formation of cages, tubes, and sheets through self-assembly
- Flexibility similar to the cytoskeleton observed
- Confirmed the reversible formation and disassembly of assembled structures

◆Applications

- Drug Delivery
- Functional Biomaterials
- Bio-nanodevices

◆Offer

- Patent License
- Option for License
- Collaborative Research

◆Contact

TLO-KYOTO Co., Ltd.

Mail: event@tlo-kyoto.co.jp
Phone: +81-75-753-9150

Level 3, International Science Innovation Bldg., Kyoto Univ., Yoshida-honmachi, Sakyo-ku, Kyoto 606-8501, Japan

IAC Institutional Advancement and Communications KYOTO UNIVERSITY

TLO-KYOTO