Life Science Center for Survival Dynamics
Tsukuba Advanced Research Alliance

TARA

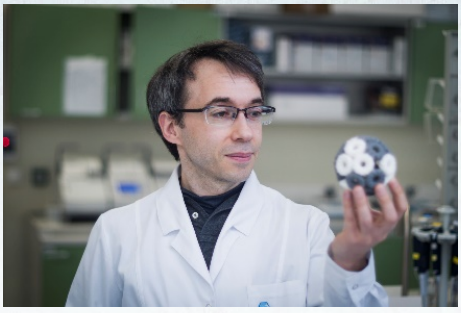
TARA Seminar

The seminar will be given in English.

Synthetic Structural Biology: Building Bespoke Protein and DNA Nanostructures

合成構造生物学：オーダーメードでタンパク質とDNAのナノ構造を作る

15:00～16:30, Thu., September 19, 2019
Seminar room, Building A, TARA Center



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Protein cages are potentially useful, particularly for medical applications: Their external surfaces can be modified to give targeting capabilities while potentially fragile cargoes can be protected in their internal cavity. Designing and building artificial cages allows us to control their properties but includes several challenges including limitations of geometry; complexity of protein-protein interactions and the challenge of programmable disassembly. We have solved several of these problems with TRAP-cage1-3, a 2.2 MDa artificial protein cage where the protein building blocks are held together by gold ion bridges rather than classical protein-protein interactions. This allows for simplicity of construction and also reversible, triggerable assembly/disassembly. In this presentation I will give an overview of our work with TRAP-cage including its design, construction and unusual characteristics and consider future developments and progress towards cargo delivery.

1. Malay, A. D. et al. An ultra-stable gold-coordinated protein cage displaying reversible assembly. Nature 569, 438-442 (2019).
2. Imamura, M. et al. Probing structural dynamics of an artificial protein cage using high-speed atomic force microscopy. Nano Lett. 15, 1331-1335 (2015).
3. Malay, A. D. et al. Gold Nanoparticle-Induced Formation of Artificial Protein Capsids. Nano Lett. 12, 2056-2059 (2012).

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