生物・医薬品工学研究センターセミナー

De novo Design of Protein and Peptide Catalysts

タンパク質のデノボデザインとペプチド触媒

日　時：　令和元年 **6** 月 **24** 日（月）

15 時 **00** 分～**16** 時 **30** 分

場　所：　富山県立大学　生物・医薬品工学研究センター　**K115** 共同会議室

来聴歓迎（参加自由）

講　師：　Ivan V. Korendovych, Ph.D.

（アメリカ合衆国：シラキュース大学 准教授）

講演要旨：

Design of a novel catalytic function in proteins and peptides, apart from its inherent practical value, is important for fundamental understanding of origins of enzymatic activity. Two applications of a minimalistic approach to design of artificial catalysts will be presented.

1. Strategic introduction of single mutations is sufficient to confer catalytic activities (Kemp elimination, ester hydrolysis, retroaldol reaction) onto calmodulin, a non-enzymatic protein. The catalytic efficiencies of the resulting allosterically regulated catalysts are on par with those of the best computational approaches. Directed evolution allowed for further improvement of catalysts' efficiency.

2. We designed a series of 7-residue peptides that self-assemble into amyloid-like fibrils to act as metal-dependent esterases and oxidases. Metal ions, help stabilize the fibril formation, while also acting as cofactors to catalyze chemical reactions. The resulting catalytic amyloids show efficiency that rivals that of some enzymes by weight. These results indicate that amyloid fibrils are able to not only catalyze their own formation – they also can catalyze chemical reactions. Thus, amyloids might have served as intermediates in the evolution of modern-day enzymes.

連絡先：富山県立大学　工学部　生物工学科　教授　浅野　泰久

TEL:0766-56-7500（内線 1530）　e-mail: asano@pu-toyama.ac.jp