Research into evaluation systems using artificial systems

R&D Project Title : Development of ultra-parallelized protein printer system

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Summary :

In enzyme screening, conventional protocols employ cell-based cloning, and cell cultivation, which are followed by purification procedures. Due to the laborious and time-consuming procedures, it is practically impossible to synthesize and evaluate more than 10^{3-4} types of enzymes with different origins at once, despite of high demands for such high throughput.

In order to address these bottlenecks, we will upgrade our previously developed cell-free enzyme screening technology in order to realize massively parallel and highly precise enzyme screening in a user-friendly and cost-effective way. For this purpose, we will integrate various cell-free technologies such DNA barcode technology, oligo assembly, recursive DNA isothermal, and cell-free gene expression systems. After effectively integrating these systems in a microchip, we will develop the protein prototyping technology, "protein printer," that enables high through put screening for GX enzymes that contribute to carbon neutrality.



