第37回HiHA Seminar

Hiroshima Research Center for Healthy Aging (HiHA)

主催: 広島大学健康長寿研究拠点

HIROSHIMA UNIVERSITY

Synthetic Biology Approach towards Creation of an Organism with a New Genetic Code

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≪Summary≫

Recoding—the repurposing of genetic codons—is a powerful strategy for enhancing genomes with functions not commonly found in nature. I will discuss the computational design, synthesis, and experimental progress toward assembly of a 3.97-megabase, 57-codon Escherichia coli genome in which all 62,214 instances of seven codons are being replaced with synonymous codons across all protein-coding genes. Our testing of 55 segments of about 50-kilobases showed that 63% of the recoded genes have been validated. We found 91% of the tested essential genes retained functionality with a limited fitness effect. We demonstrate identification and correction of lethal design exceptions, only 13 of which were found in 2229 genes. This work underscores the feasibility of rewriting genomes and establishes a framework for large-scale design, assembly, troubleshooting, and phenotypic analysis of synthetic organisms.

※本セミナーは5研究科共同セミナーです。

開催日時：平成 31 年 2月 15日(金) 14:30～

会場：広島大学先端科学総合研究棟 3F 302S会議室

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