

平成 28 年度 総合分析実験センターセミナー — 第 3 回 —

日時： 平成 28 年 11 月 1 日（火曜日） 16:30～

場所： 佐賀大学農学部 1 号館 1 階第二講義室

注：今回のセミナーは本庄キャンパス開催です。ご注意ください。

演者： Dr. Lee ChangWoo (李 昌禹 先生)

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演題： The Role of a Conserved Active Site Wall Tryptophan or Tyrosine Residue in Temperature Adaptation of Enzymes

要旨： Cold-adapted enzymes exhibit enhanced conformational flexibility as compared with their mesophilic counterparts, especially in their active sites. Multiple sequence alignment showed that tryptophan (Trp) is preferred in the active site wall of cold-adapted esterases and tyrosine (Tyr) is preferred in the active site wall of hyperthermophilic esterases. We carried out site-directed mutagenesis for Trp 208 in cold-adapted esterase EstK and Tyr 182 in hyperthermophilic esterase EstE1 and compared biochemical properties of wild-type and mutant enzymes. Hydrogen bonding involving Trp 208 or Tyr 182 was critical to stabilize the catalytic histidine residue in both EstK and EstE1. However, the effect of mutations on thermal stability was different between EstK and EstE1. We will discuss the roles of Trp and Tyr residues in temperature adaptation of cold-adapted and hyperthermophilic esterases.

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EstK      GTPAIKFQVLLWPVTD-ASFET 217
rPPE      GTPALRFQLLLWPVTDAS-FET 126
Q3K919    GTPAIKFQVLLWPVTD-ANFDT 216
EstE1     GEKLVKKQVLIYPVVNGTGVPT 192
Est2      GGPALAFQLLIYPSTGYDPAHP 193
AFEST     GEDFIKHQILIYPVVN-FVAPT 197
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Multiple sequence alignment of cold-adapted esterases (EstK, rPPE, and Q3K919) and hyperthermophilic esterases (EstE1, Est2, and AFEST).

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