

Poster Presentation

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*Crystal Structure analyses of dipeptidyl aminopeptidase BII from P. mexicana*WO24.

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The peptidase family S46 that contains the dipeptidyl aminopeptidase BII (DAP BII) from *Pseudoxanthomonas mexicana* WO24 is the only exopeptidase family in clan PA peptidases. Our present phylogenetic and experimental studies indicated that the catalytic triad of DAP BII is composed of His 86, Asp 224 and Ser 657 and implied that unknown large helical domains involved in exopeptidase activity[1]. However, three-dimensional structure of a family S46 peptidase has not yet been reported. Thus, the crystal structure of DAP BII is essential not only to understand the catalytic mechanism of family S46 peptidases but also to clarify the structural origin of the exo-type peptidase activities of these enzymes. Recently, we have successfully crystallized the DAP BII and collected X-ray diffraction data to 2.3 Å resolution from the crystal. This crystal belonging to space group $P2_12_12_1$, with unit-cell parameters $a = 76.55$ Å, $b = 130.86$ Å, $c = 170.87$ Å[2]. Structural analysis by the multi-wavelength anomalous diffraction method is underway[3]. Here, we report the first crystallization and structural analysis of the DAP BII from *P. mexicana* WO24 as family S46 peptidase. Other enzymes that belong to this family are DPP7 and DPP11 from *Porphyromonas gingivalis*, DPP11 from *Porphyromonas endodontalis* (periodontal pathogen) and DPP11 from *Shewanella putrefaciens* (multidrug resistance associated opportunistic pathogen). These gram-negative bacterial pathogens are known to be asaccharolytic. Especially, *Porphyromonas gingivalis* is known to utilize dipeptides, instead of free amino acids, as energy source and cellular material. Since S46 peptidases are not found in mammals, we expect our study will be useful for the discovery of specific inhibitors to S46 peptidases from these pathogens.

[1] Suzuki et al., *Scientific Reports*, 4 4292 (2014), [2] Sakamoto et al., *Acta Crystallogr. F Struct. Biol. Commun.*, 70, 221-224 (2014), [3] Sakamoto et al., *Scientific Reports*, in press(2014).

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