

DATE: 01 May 2025

SUMMARY of 2024 RESEARCH RESULTS REPORT For International Collaborative Research with IPR, Osaka University

Research Title		Crystallization and X-ray analysis of lignocellulose-degrading enzyme from Indonesia local isolate
Applicant	Name	Prof. Dr. Ni Nyoman Tri Puspaningsih, M.Si.
	Affiliation	(1) Department of Chemistry, Faculty of Science and Technology, Universitas Airlangga, INDONESIA (2) University-CoE-Research Center for Bio-Molecule Engineering, Universitas Airlangga, INDONESIA
	Present Title	Professor
Research Collaborator (Host PI)		Prof. Genji KURISU
<p>Summary</p> <p>CelGH5 is a halophilic cellulase isolated from oil palm waste decomposition, exhibiting enhanced catalytic activity in high-salinity environments. Comparative sequence analysis confirms its novel molecular identity, with structural studies revealing a hexameric configuration. Each subunit (Chains A–F) shares sequence similarity but shows structural variations, highlighting the complexity of its enzymatic mechanism. Crystallization trials yielded single CelGH5 crystals with a 2.13 Å resolution, demonstrating feasibility for three-dimensional structural determination. Structural refinement using Phenix and WinCoot improved R-work (0.2517) and R-free (0.2847) values, though further optimization is required. Ramachandran plot analysis confirmed 96.73% favored regions, with minor outliers affecting stability. Active-site analysis identified 135-Glu and 252-Glu as key catalytic residues, emphasizing their role in substrate cleavage. Future research will refine CelGH5's experimental structure, optimize its ligand-binding interactions, and finalize its Protein Data Bank (PDB) submission. Collaboration between Osaka University and Airlangga University continues to advance molecular insights and industrial applications, ensuring CelGH5 contributes to bioprocessing, biofuel production, and sustainable enzyme engineering.</p>		

***Deadline: May 9, 2025**

***Please submit it to E-mail: tanpakuken-kyoten@office.osaka-u.ac.jp.**

***Please describe this summary within 1 sheet. Please DON'T add some sheets.**

***This summary will be published on the web.**