

DATE: Day 18 Month 4 Year 2026

SUMMARY of FY2025 RESEARCH RESULTS REPORT For International Collaborative Research with IPR, The University of Osaka

Research Title		Structural analysis of Ca ²⁺ binding proteins from Schistosoma mansoni
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Summary

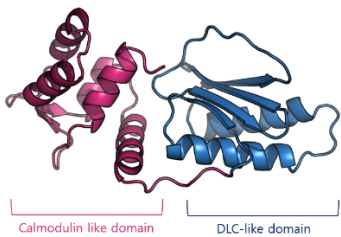
This collaborative study focused on preparing SmTAL family proteins from Schistosoma mansoni for structural analysis. SmTAL proteins are tegumental allergen-like Ca²⁺ binding proteins of biological interest because they are expected to participate in calcium-dependent regulation in the parasite, yet structural information for several family members remains limited. The present work therefore aimed to obtain recombinant SmTAL samples suitable for structural studies, evaluate their behavior under Ca²⁺-relevant conditions, and carry out initial crystallization screening.

During the program period, protein preparation and preliminary crystallization experiments were performed using standard expression, purification, and screening workflows. Broad conditions varying pH, precipitant, and salt composition were used to judge whether the samples remained sufficiently stable and homogeneous for crystallization trials and to identify formulations worth further optimization (Fig 1 a).

In this study, we obtained various crystal forms from multiple SmTAL-related samples, including N-terminal constructs, C-terminal constructs, and ligand-complex samples. However, several crystallization conditions resulted in precipitation, weak phase separation, or poorly formed crystals, indicating that improved sample homogeneity and more targeted optimization will be required. Recently, we solved the overall structure of SmTals using Se-Met data (Fig 1b). Overall, we are continuing to develop these projects using small-molecule screening at SPring-8 facilities.



(a) The photo of crystals



b) Overall structure of SmTALs