

Bacterial pseudokinase catalyzes protein polyglutamylation to inhibit the SidE-family ubiquitin ligases

D Tomchick¹, M Black², A Osinski², M Gradowski³, K Servage², K Pawlowski³, V Tagliabracci²

¹UT Southwestern Medical Center, Irving, TX, ²UT Southwestern Medical Center, Dallas, TX,

³Warsaw University of Life Sciences, Warsaw, Poland

diana.tomchick@utsouthwestern.edu

Enzymes with a protein kinase fold transfer phosphate from adenosine 5'-triphosphate (ATP) to substrates in a process known as phosphorylation. Here, we show that the *Legionella* meta-effector SidJ adopts a protein kinase fold, yet unexpectedly catalyzes protein polyglutamylation. SidJ is activated by host-cell calmodulin to polyglutamylate the SidE family of ubiquitin (Ub) ligases. Crystal structures of the SidJ-calmodulin complex reveal a protein kinase fold that catalyzes ATP-dependent isopeptide bond formation between the amino group of free glutamate and the γ -carboxyl group of an active-site glutamate in SidE. We show that SidJ polyglutamylation of SidE, and the consequent inactivation of Ub ligase activity, is required for successful *Legionella* replication in a viable eukaryotic host cell.

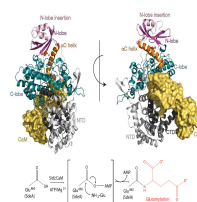


Figure 1