

Aubry, L., S. Lee, K. Ravel and R.A. Firtel (2003). The novel ankyrin-repeat containing kinase ARCK-1 acts as a suppressor of the Spalten signaling pathway during Dictyostelium development. *Devel. Biol.* 263:308-322.

Spalten (Spn), a member of the PP2C family of Ser/Thr protein phosphatases, is required for Dictyostelium cell-type differentiation and morphogenesis. We have identified a new protein kinase, ARCK-1, through a second site suppressor screen for mutants that allow spn null cells to proceed further through development. ARCK-1 has a C-terminal kinase domain most closely related to Ser/Thr protein kinases and an N-terminal putative regulatory domain with ankyrin repeats, a 14-3-3 binding domain, and a C1 domain, which is required for binding to RasBGTP in a two-hybrid assay. Disruption of the gene encoding ARCK-1 results in weak, late developmental defects. However, overexpression of ARCK-1 phenocopies the spn null phenotype, consistent with Spn and ARCK-1 being on the same developmental pathway. Our previous analyses of Spn and the present analysis of ARCK-1 suggest a model in which Spn and ARCK-1 differentially control the phosphorylation state of a protein that regulates cell-type differentiation. Dephosphorylation of the substrate by Spn is required for cell-type differentiation. Control of ARCK-1 and Spn activities by upstream signals is proposed to be part of the developmental regulatory program mediating cell-fate decisions in Dictyostelium.