

Han, Y-H., C.Y. Chung, S. Stephens, D. Wessels, M.A. Titus, D.R. Soll and R.A. Firtel (2002). Requirement of a vasodilator-stimulated phosphoprotein (VASP) family member for cell adhesion, the formation of filopodia, and chemotaxis in Dictyostelium. *J. Biol. Chem.* 277:49877-49887.

We have examined the function of a member of the vasodilator-stimulated phosphoprotein family of proteins (DdVASP) in Dictyostelium. Ddvasp null cells lack filopodia, whereas targeting DdVASP to the plasma membrane with a myristoyl tag results in a significant increase in filopodia. The proline-rich domain-Ena/VASP homology 2 structure is required for both actin polymerization activity and filopodia formation. Ddvasp null cells exhibit a chemotaxis defect, which appears to be due to a defect in the ability of cells to properly adhere to the substratum and remains elevated for up to 1 min. These defects lead to a significant decrease in chemotaxis efficiency. DdVASP localizes to the leading edge in migrating cells and to the tips of filopodia. In addition, Ddvasp null cells have a defect in particle adhesion but internalize particles normally. Our results provide new insights into the function of DdVASP in controlling the actin cytoskeleton during chemotaxis and filopodia formation.