IQ motif selectivity in human IQGAP1: binding of myosin essential light chain and S100B

Pathmanathan,S., Elliott, S.F., Swiggen,M.C., Greer,B., Harriott, P., Irvine, G.B. And Timson, D.J.,

Abstract

IQGAPs are cytoskeletal scaffolding proteins which link signalling pathways to the reorganisation of actin and microtubules. Human IQGAP1 has four IQ motifs each of which binds to calmodulin. The same region has been implicated in binding to two calmodulin-like proteins, the myosin essential light chain Mlc1sa and the calcium and zinc ion binding protein S100B. Using synthetic peptides corresponding to the four IQ motifs of human IQGAP1, we showed by native gel electrophoresis that only the first IQ motif interacts with Mlc1sa. This IQ motif, and also the fourth, interacts with the budding yeast myosin essential light chain Mlc1p. The first and second IQ motifs interact with S100B in the presence of calcium ions. This clearly establishes that S100B can interact with its targets through IQ motifs in addition to interacting via previously reported sequences. These results are discussed in terms of the function of IQGAP1 and IQ motif recognition.